Claims 1 and 2 are directed to a two step method; the first step requires embossing a channel or opening in a green tape; and the second step requires screen printing an ink into the channels or openings.

The IBM reference discloses embossing a pattern into a green tape surface. However, the green tape is cast onto a Mylar® tape that has been coated with a PVA coating. When the green tape is separated from the Mylar® tape, the PVA coating adheres to the surface of the green tape. The reference describes the next step as "squeegeeing" a metal paste made from a metal powder and an organic vehicle into the lines in the green tape. The reference is careful to state that the organic vehicle be such that it does not attack the PVA film. Thus the PVA remains on the exposed surfaces of the green tape and between the green tape and the metal paste layer. Thus this PVA layer remains in the openings until after the green tape is fired. This PVA layer does take some space in the openings, and it is unknown what effect it may have on the metal paste during firing.

Applicants emboss channels or openings into a green tape and fill them with a suitable ink, as a conductor ink, without any PVA or other organic coating on the green tape being present.

Thus the reference does not anticipate the present claims 1-2.

The Examiner further states that a metal powder paste is screen printed into the openings, but that is not clear from the reference. The ink may be doctor bladed into the embossed lines for example.

Claim 3 has been rejected under 35 USC 103 over the IBM reference. This rejection is also traversed. Claim 3 requires that the conductor ink be made from silver and that it have a viscosity of about 30 poise. The Examiner states that it would be obvious to screen print such an ink. However, as applicants have shown in TABLE I on page 10 of their specification, typical screen printable conductor inks have a higher viscosity of 45 poise, rather than the 30 poise required in claim 3. Since claim 3 depends from claim 2, the problem of the PVA coating is also applicable here; applicants do not use a PVA layer to line the green tape openings. Thus applicants submit that claim 3 is not obvious over the IBM reference.

Claims 4-8, 11 and 12 have been rejected under 35 USC 103 over IBM in view of Vitriol et al. This rejection is also traversed.

Vitriol et al is directed to shaping flat green tapes during

the firing step, as in a mold, at a temperature at which the green tape becomes plastic. The reference does refer to patterning the green tape to include various electrical components such as resistors and capacitors in addition to circuit patterns, but no details are given.

The present claims 1-8 and 11 are not obvious over the references because Vitriol et al does not supply the inadequacies of the IBM reference. Screen printing of a conductor ink is mentioned, but no specific conductor inks are disclosed, nor their viscosity.

Further, Vitriol et al do not mention embossing patterns in a green tape at all, but of depositing conductors over green tape layers. Thus other than that this reference describes various combinations of green tape and components, no reason to combine the references is apparent.

Claims 9 and 10 have been rejected under 35 USC 103 as unpatentable over IBM further in view of Prabhu '724.

These claims require embossing an opening in a green tape, screen printing a component material into the opening, burying the green tape in a green tape stack, laminating the green tape stack on a support board coated with a low melt temperature

glass, and firing to densify the glass of the green tape.

IBM's inadequacies with respect to the above method have been discussed above. Further, IBM discloses stacking layers of green tape. However, no support board for the green tape stack is disclosed.

Prabhu discloses making a multilayer circuit board supported on a metal board using a bonding glass to adhere the green tape stack to the metal board after firing. However, Prabhu does not disclose any embossing step at all. Thus applicants submit no reason to combine these references except in light of hindsight in view of applicants's specification is apparent.

The advantage of combining an embossing step with conventional green tape technology is that the line definition is improved. Instead of depositing metal inks in a pattern on the green tape and then laminating the green tapes together, the embossing step buries conductive lines so that they do not stick up above the surface and become thinner or distorted during the lamination step. This improves the RF loss characteristics. By embossing openings in a green tape for placement of components, again the openings are made so that the components are flush with the surface of the green tape, improving tolerances and

preventing distortions during the laminating step.

Thus applicants submit the present advantageous process is not anticipated or obvious over the prior art. Thus applicants submit claims 1-11 are in condition for allowance. Accordingly, reconsideration and allowance are respectfully solicited.

If the Examiner believes a telephone interview would advance the prosecution of this application, he/she is invited to contact the undersigned.

A Petition for a one month extension of the term for response is also attached, bringing the due date to June 10, 2000.

Respectfully submitted,

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Docket No. SAR 12743

I hereby certify that this correspondence is being deposited as first class mail with the United States Postal Service in an envelope addressed to the Assistant Commissioner for Patents, Washington, DC 20231 on

June 2, 2000

William R. Morris
Person making deposit

William R. Morris
Signature